Versatility of Bambara Groundnut (Vigna subteranea) for Food and Nutrition Security

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“Africa has the greatest challenge of food security today but Africa also has the potential not only to feed itself but also the world tomorrow . . .”

— Dr. Namanga Ngongi,
President, Alliance for a Green Revolution in Africa (AGRA)
What is Food Security?

Food Availability

Diversity

Food Security

Economic Value

Food Access

Consumer appeal & Willingness to pay a premium

Value Addition
Bambara Groundnut

- **Protein**: 15-25%
- **Fat**: 4.5-7.4%
- **Fibre**: 5.2-6.4%
- **Ash**: 3.2-4.4%
- **Mineral**: 2%
- **Carbohydrate**: 49-63.5%
BGN & Indigenous Knowledge

- Abscesses & infected wounds
- Epilepsy
- Aphrodisiac
- Cataracts
- Venereal disease
- Diarrhoea
- Insecticide
- Impotence
- Morning sickness
BGN Nutritional Benefits

**Nutritionally versatile**
- Rich in protein, essential amino acids,
- PUFA, minerals, energy value

**Desirable functionality**
- WAC, OAC, foaming capacity,
- Gelation properties

**Pharmaceutical value**
- Anticancer activities, antimicrobial activity
- Hypo cholesterol, anti-diabetic activity, etc

**Bioactive compounds**
- Antioxidant
- Phenolic compounds (flavonoids, favonols, etc)
The Problem!

Not much is known about its nutraceutical potential.

Limited ways to consume Bambara groundnuts

Consumers are unaware of its rich nutritional benefits

Urgent need to find more ways to consume BGN as a source of food and nutrition.
Objective

• Highlight the potential of BGN as a source of food and nutrition for food security
Materials & Methods

Literature information on the uses of BGN was obtained. Information described as a set of interconnected objects

Network metrics (nodes, edges, in-degree, out-degree, centrality, betweenness centrality) analysed using Harel-Koren Fast Multiscale method NodeXL software

Information described as a set of interconnected objects
• In-degree is the number of edges that point inward at a node or the number of relationships in which a particular node is the target.

• High in-degree is associated with the functional (11) and therapeutic (10) use of BGN.

• Hence, the usefulness of BGN is more targeted to functional food and therapeutic uses.

Node size proportional to in-degree statistics

- 33 Nodes
- 58 Edges
• Centrality helps to determine the key players or most prominent member of a network.

• Betweenness centrality-number of times a node falls along the shortest path between two other nodes and it’s also a measure of the control of a network.

• BGN seeds (443.8), flour (257.2), therapeutic value (278.6), functional food (198) and its protein (141.8) control the value of BGN

Node size proportional to betweenness centrality statistics
Versatility of BGN
BGN Milk & Yoghurt

Bam Flour

South Africa Patent 2013/00683
Bamilk

- Non-dairy beverage
- Snack-on-the-go
- Rich in protein
- Low in fat
- Antimicrobial property
BamPro

- Cultured non-dairy drink
- Lactose & cholesterol free,
- Low in fat,
- Rich in protein, fibre and antioxidant
- Added probiotics for maintaining good balance and composition of intestinal flora.
- Antimicrobial property
BGN Fibres

Bam Flour

BamFibre S

BamFibre I

South Africa Patent 2014/04371
BamFibre -I

- Natural
- Highly absorptive functional food
- Increases dough volume
- Fat replacer in dough
- Gluten, lactose and cholesterol free.

**Health benefits –**

- lower cholesterol levels,
- levelling out of blood glucose
- source of insoluble dietary fibre
BamFibre-S
Source of soluble fibre.

- Natural - Gluten, lactose and cholesterol free
- Potential as stabiliser and cryoprotectant in food.
- Aids detoxification and waste excretion
- Suitable for high temperature applications such as baking.
- **Health benefits** - lowering of cholesterol levels, levelling out of blood glucose and detoxing aid.
- Support the growth of probiotic bacteria
- Potential for use in weaning foods.
Bambara groundnut Flour in Emulsion

- High processability
- Good pourability
- High spreadability
- Good chewability
- Good stability

Rheological properties:
- Thixotropic fluid
- Non-Newtonian
- Rheological properties
- Pseudoplastic
- Yield stress
- High viscoelastic fluid
- Thick viscous fluid
Versatility of BGN Flour

- Gluten free

- Chocolate Brownies
- Muffins
- Pizza Dough
- Pasta
- Crackers
Versatility of BGN Flour
Conclusion

• BGN has potential to improve the livelihoods of humans.
• BGN can provide food, income and nutrition security.
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